



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/068,374	02/06/2002	Andrew Shaw	GC652	6144

7590 12/23/2004

H. THOMAS ANDERTON
GENENCOR INTERNATIONAL, INC.
925 PAGE MILL ROAD
PALO ALTO, CA 94304

EXAMINER

SAIDHA, TEKCHAND

ART UNIT PAPER NUMBER

1652

DATE MAILED: 12/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/068,374

Applicant(s)

SHAW, ANDREW

Examiner

Tekchand Saidha

Art Unit

1652

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 October 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23-27 and 33-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 23-27 & 33-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Final Rejection

1. Applicants' Amendment filed October 21, 2004 is acknowledged. Claims 23-27 & 33-39 are pending in this examination. Claims 28-32 were previously cancelled. Claims 1-22 remain withdrawn, as being drawn to a non-elected invention, the requirement having been traversed.

2. Rejoinder- Process claims that depend from or otherwise include all the limitations of the patentable product will be entered as a matter of right if the amendment is presented prior to final rejection or allowance, whichever is earlier. Amendments submitted after-final rejection are governed by 37 CFR 1.116; amendments submitted after allowance are governed by 37 CFR 1.312.

As indicated above and in the prior Office Action method claims will be rejoined provided they are of the same scope. So far the claims are not patentable, and the withdrawn process claims therefore cannot be rejoined.

3. ***Claim Rejections - 35 USC § 112 (first paragraph)***

Enablement

Claims 33-39 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for an isolated modified target enzyme of SEQ ID NO: 2 [*Bacillus sp.* Cellulose 103], wherein catalytic triad Ser-His-Glu is modified to another amino acid, and wherein the catalytic triad comprises a first member, a second member and a third member, and said first member is proton donor, said second member is Histidine 200 residue in the *Bacillus cellulase* 103 sequence (SEQ ID NO: 2), and said third member is Serine 227 residue in the *Bacillus cellulase* 103 sequence

Art Unit: 1652

(SEQ ID NO: 2), does not reasonably provide enablement for any target enzyme from any source modified to comprise a catalytic triad to include a first member proton donor, a second member being equivalent to His-200 and a third member being equivalent to Ser-227 residue of SEQ ID NO: 2. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with the claims. Factors to be considered in determining whether undue experimentation is required, are summarized in In re Wands (858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988)) [*Ex parte* Forman [230 USPQ 546 (Bd. Pat. App. & Int. 1986)]]. The Wands factors are: (a) the quantity of experimentation necessary, (b) the amount of direction or guidance presented, (c) the presence or absence of working example, (d) the nature of the invention, (e) the state of the prior art, (f) the relative skill of those in the art, (g) the predictability or unpredictability of the art, and (h) the breadth of the claim. The factors most relevant to this rejection are [the scope of the claims, unpredictability in the art, the amount of direction or guidance presented, and the amount of experimentation necessary].

The claims are drawn to encompass any modified target enzyme from any source that includes the three member modified catalytic triad construct having first member proton donor, a second member is Histidine 200 residue in the *Bacillus cellulase* 103 sequence (SEQ ID NO: 2), and a third member is Serine 227 residue in the *Bacillus cellulase* 103 sequence (SEQ ID NO: 2). The specification, however, only discloses a single modified target enzyme of SEQ ID NO: 2, a *Bacillus cellulase* 103 sequence wherein the triad is modified to include a proton, His200 and Ser227. There is

Art Unit: 1652

no disclosure or description of a construct incorporating such a modified catalytic triad comprising a 'a proton, His200 and Ser227' into enzyme from any other source in order to alter the pH profile of any of the target enzyme.

Bacillus cellulase 103 sequence of SEQ ID NO: 2 as given in the sequence listing consists amino acid residue glutamate (E) at position 139, glycine (G) at position 200 and aspartate (D) at position 227. It is impossible to determine the equivalence of these positions in any target enzyme, because the catalytic triad defined by the prior art varies among different enzyme. For example, the catalytic triad for some lipase is shown to be 'Serine-Histidine-Aspartate' and for some 'Serine-Histidine-Glutamate' [Lowe, M. E. Biochimica et Biophysica Acta (1996 July 26) 1302 (2) : 177-83]. Further it is well known that there are different classes of lipases [lipases A, B, C, ext.] and very little sequence homology. Therefore, one skilled in the art would not know how to equate the positions of the triad in *Bacillus* cellulase 103 sequence of SEQ ID NO: 2 to that from any target enzyme.

While recombinant techniques are known, it is not routine in the art to screen mutations from among the numerous enzyme as to which among the numerous would function differently that the original sequence of SEQ ID NO: 2, thus leading to unpredictability. The specification does not identify any distinguishing properties of the catalytic triad obtained from SEQ ID NO: 2 which will have a universal applicability for any enzyme known in the prior art, in order that a person skilled in the art can modify any target enzyme from any source based upon the teachings of a single construct.

The scope of the claims is not commensurate with the enablement provided by the disclosure with regard to the extremely large number of target enzyme(s) broadly encompassed by the claims.

Thus, applicants have not provided sufficient guidance to enable one skilled in the art to make and use the claimed invention in a manner reasonably correlated with the scope of the claims. The scope of the claims must bear a reasonable correlation with the scope of enablement (In re Fisher, 166 USPQ 19 24 (CCPA 1970)). Without sufficient guidance, isolation and construction of any target enzyme comprising a catalytic triad construct obtained from SEQ ID NO: 2 is unpredictable and the experimentation left to those skilled in the art is unnecessarily, and improperly, extensive and undue. See In re Wands 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988).

Written Description

4. Claims 33-39 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 33-39 are directed to any target enzyme from any source modified to comprise a catalytic triad to include a first member proton donor, a second member being His-200 and a third member being Ser-227 residue of SEQ ID NO: 2. The specification discloses an isolated modified target enzyme of SEQ ID NO: 2 [*Bacillus sp.* Cellulose 103], wherein catalytic triad Ser-His-Glu is modified to another amino acid,

Art Unit: 1652

and wherein the catalytic triad comprises a first member, a second member and a third member, and said first member is proton donor, said second member is Histidine 200 residue in the Bacillus cellulase 103 sequence (SEQ ID NO: 2), and said third member is Serine 227 residue in the Bacillus cellulase 103 sequence (SEQ ID NO: 2).

The specification, however, only provides a single representative species of the triad construct in SEQ ID NO: 2. There is no disclosure of any particular structure to function/activity relationship in the single disclosed species to other species where such sequences are conserved in order to establish a relationship among species in order to identify other enzyme(s) from any source where such a modification may result in a function, similar to the triad construct taught in the single example. The specification also fails to describe additional representative species which may have similar or related triad domain or regions which may be readily identified by any identifying structural characteristics and used in the preparation of the triad constructs, for which no predictability of structural characteristics are apparent. Given this lack of additional representative species, and lack of structure; and where no structure to functional relationship is apparent, Applicants have failed to sufficiently describe the claimed invention, in such full, clear, concise, and exact terms that a skilled artisan would recognize Applicants were in possession of the claimed invention.

5. ***Claim Rejections - 35 USC § 112*** (second paragraph)

Art Unit: 1652

Claims 23-27 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 23, lines 1-2, recites the phrase 'comprising SEQ ID NO: 2, comprising a polypeptide genetically modified to comprise a catalytic triad.....'. The claim is confusing and unclear in the repetitive use of the word(s) 'comprising/comprise' in the same sentence. Amending this segment [lines 1-2] of the claim to – "An isolated, modified target enzyme of SEQ ID NO: 2, comprising a catalytic triad that alters the pH profile...", will overcome this rejection.

Claims 24-27 are included in the rejection for failing to correct the defect present in the base claim(s).

6. Any objection or rejection of record which is not expressly repeated in this Office Action has been overcome by Applicant's response and withdrawn.

7. Applicant's arguments filed October 21, 2004 have been fully considered but they are not deemed to be persuasive as explained below.

Applicants argue that the originally filed claims are enabled, meet the written description requirement and are definite. Applicants do not address any of the issues raised in the rejections under enablement and written description requirement, perhaps with the view that the claim as amended would overcome these rejections.

Applicants' amendment to claims 23-27, have indeed overcome the rejections of these claims under enablement and written description requirement, and have been

Art Unit: 1652

withdrawn. However, these rejections have been maintained for claims 33-39, for reasons of record.

Applicants argue that the claim recitation of the term 'equivalent' has been deleted. Applicants also expressly reserve the right to pursue the original and/or similar claims in subsequently filed applications. According the indefiniteness rejection for the term 'equivalent', is withdrawn.

8. No claim is allowed.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for response to this final action is set to expire THREE MONTHS from the date of this action. In the event a first response is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tekchand Saidha whose telephone number is (571) 272 0940. The examiner can normally be reached on 8.30 am - 5.00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ponnathapu Achutamurthy can be reached on (571) 272 0928. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Tekchand Saidha
Primary Examiner, Art Unit 1652
Recombinant Enzymes, E03A61 Remsen Bld.
400 Dulany Street, Alexandria, VA 22314
Telephone : (571) 272-0940

December 14, 2004